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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|----------------------|
| 10/642,275 | 08/18/2003 | Takenori Sekijima | 36856.1106 | 2451 |
| 7590 | 06/09/2005 | | EXAMINER | |
| Keating & Bennett LLP Suite 312 10400 Eaton Place Fairfax, VA 22030 | | | | WHITTINGTON, KENNETH |
| | | ART UNIT | PAPER NUMBER | 2862 |

DATE MAILED: 06/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

| | | |
|------------------------------|------------------------|-----------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/642,275 | SEKIJIMA ET AL. |
| | Examiner | Art Unit |
| | Kenneth J. Whittington | 2862 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-20 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

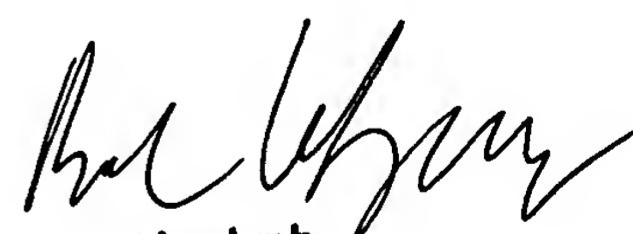
Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 18 August 2003 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.



Bot Ledyrh
Primary Examiner

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>8/18/03</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Claim Objections***

Claims 2 and 12 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit 5 the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The replacement of one element (Pr or Ce) for another (Tb) is not further limiting. A recitation of the 10 Faraday rotator "further comprising" such elements would overcome the objection.

Claims 9 and 18 are objected to because of the following informalities: there is no antecedent basis for "the total 15 reflecting mirror" and the polarizer such that a collective lens can be located there between. Limitations of claim 7 are being read into claim 9, however, claim 9 does not depend from claim 7. A similar issue exists with claim 18. Perhaps amending claim 8 to depend from claim 7 and amending claim 18 to depend 20 from claim 17 would address this problem. Appropriate correction is required. For purposes of examination, claim 9 will be interpreted to include the features of claims 1, 7 and

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8, and claim 18 will be interpreted to include the features of claims 11 and 17.

Claim 11 is objected to for not being clear whether
5 features are included, i.e., the term "mm" in parenthesis. It is not clear whether this is a limitation or example. For purposes of examination, the diameter A and distance B will be interpreted to have dimensions in mm. Positive recitation or removal from the claim is required.

10

Claim 11 is objected to because it recites dimensions of the Faraday rotator that includes various components. The dimensions are related to the paramagnetic material, not the rotator assembly, and the claim should be amended as such.
15 Appropriate correction is required.

Claims 13 and 14 are objected to because each recites the location of the analyzer and polarizer with respect to the Faraday rotator when in claim 11 both components are part of the
20 rotator. They cannot oriented with respect to the rotator and part of it simultaneously. Appropriate correction is required. Amending the claims such that they are oriented with respect to the paramagnetic material would overcome this objection.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

5 A person shall be entitled to a patent unless -
 (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10 Claims 1, 3-6 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Rubenstein et al. (US 3,368,861).

Regarding claims 1 and 10, Rubenstein et al. discloses a Faraday rotator including a paramagnetic material (See Rubenstein et al. FIG. 1, item 13), a polarizer (item 12), an analyzer (item 16), 15 a light irradiating element (item 10), a light sensing element (item 16), wherein the paramagnetic material is made of terbium aluminum garnet ($Tb_3Al_5O_{12}$) (See col. 1, lines 53-57).

Regarding claims 3-6, Rubenstein et al. teaches the polarizer, analyzer and paramagnetic material aligned on the 20 optical axis such axis, such that the light beam is incident on the polarizer, then through the paramagnetic material, and then the analyzer (See FIG. 1).

Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Shirai et al. (US 5,493,222). Regarding claims 1

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and 2, Shirai et al. discloses a Faraday rotator including a paramagnetic material (See Shirai et al. FIG. 1, item 3), a polarizer (item 2), an analyzer (item 4), a light irradiating element (item 1), a light sensing element (not shown but used to determine intensity of light from the analyzer, see col. 2, lines 1-28), wherein the paramagnetic material is made of various combinations including at least one of terbium and cesium, as well as others, and aluminum (See col. 3, lines 53-62 and col. 8, lines 26-36, note that Shirai et al. teaches an improvement on the materials of the prior art paramagnetic materials).

Regarding claims 3-6, Shirai et al. teaches the polarizer, analyzer and paramagnetic material aligned on the optical axis such axis, such that the light beam is incident on the polarizer, then through the paramagnetic material, and then the analyzer (See FIG. 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at

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the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5 The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

- 10 1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

15 Claims 11, 13-16 and 20 are rejected under 35 U.S.C. 103 as being obvious over Rubenstein et al. Regarding claims 11 and 20, Rubenstein et al. discloses a Faraday rotator including a paramagnetic material (See Rubenstein et al. FIG. 1, item 13), a polarizer (item 12), an analyzer (item 16), a light irradiating element (item 10), a light sensing element (item 16), wherein the paramagnetic material is made of terbium aluminum garnet ($Tb_3Al_5O_{12}$) (See col. 1, lines 53-57). However, while Rubenstein et al. discloses a columnar paramagnetic material, it does not disclose the particular dimensions of the material.

20 Nonetheless, it would have been obvious at the time the invention was made for a person having ordinary skill in the art to use a specific dimension for the material, such as in the

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range of millimeters (mm). One would have been motivated to do so to fit the material and Faraday rotator assembly in a particular apparatus or measurement structure. Furthermore, where the only difference between the prior art and the claims 5 was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

See *In Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 10 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984). Because Rubenstein et al. discloses all of the features of the claimed apparatus and operates in the same manner, claim 11 is not patentably distinct from the Faraday rotator of Rubenstein et al.

15 Regarding claims 13-16, Rubenstein et al. teaches the polarizer, analyzer and paramagnetic material aligned on the optical axis such axis, such that the light beam is incident on the polarizer, then through the paramagnetic material, and then the analyzer (See FIG. 1).

20

Claims 11-16 are rejected under 35 U.S.C. 103 as being obvious over Shirai et al. (US 5,493,222). Regarding claims 1 and 2, Shirai et al. discloses a Faraday rotator including a

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paramagnetic material (See Shirai et al. FIG. 1, item 3), a polarizer (item 2), an analyzer (item 4), a light irradiating element (item 1), a light sensing element (not shown but used to determine intensity of light from the analyzer, see col. 2, 5 lines 1-28), wherein the paramagnetic material is made of at least terbium and aluminum garnet (See col. 3, lines 53-62 and col. 8, lines 26-36, note that Shirai et al. teaches an improvement on the materials of the prior art paramagnetic materials). However, while Shirai et al. discloses a columnar 10 paramagnetic material, it does not disclose the particular dimensions of the material. Nonetheless, it would have been obvious at the time the invention was made for a person having ordinary skill in the art to use a specific dimension for the material, such as in the range of millimeters (mm). One would 15 have been motivated to do so to fit the material and Faraday rotator assembly in a particular apparatus or measurement structure. Furthermore, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative 20 dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. See *In Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830,

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225 USPQ 232 (1984). Because Shirai et al. discloses all of the features of the claimed apparatus and operates in the same manner, claim 11 is not patentably distinct from the Faraday rotator of Shirai et al.

5 Regarding claims 13-16, Shirai et al. teaches the polarizer, analyzer and paramagnetic material aligned on the optical axis such axis, such that the light beam is incident on the polarizer, then through the paramagnetic material, and then the analyzer (See FIG. 1).

10 Claims 7, 8, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rubenstein et al. in view of Emo et al. (US 4,483,232). Rubenstein et al. discloses or teaches the features of claims 1 and 11 respectively as discussed above.

15 However, it does not disclose the use of total reflection mirrors. Emo et al. teaches incorporating a magnetic field sensing device including a Faraday rotator that includes total reflection mirrors between the light-irradiating element and the polarizer (See FIGS. 2 and 3, items 48, 113, and 34) and between 20 the analyzer and the light-sensing element (items 52, 36 and 115). It would have been obvious at the time the invention was made to incorporate mirrors into the apparatus of Rubenstein et al. One having ordinary skill in the art would have motivated

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to do so to provide mechanisms for directing the light from the light irradiating element along the axis of the paramagnetic material and for redirecting the light back towards the light-sensing element when the Faraday rotator is being used as a magnetic field sensing unit (See Emo et al. col. 3, lines 16-47).

Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rubenstein et al. in view of Emo et al. as applied to claims 7, 8, 17 and 18 above, and further in view of Onaka et al. (US 2003/0210451). The noted combination does not teach placing collecting lenses adjacent to the polarizer and the analyzer. Onaka et al. teaches placing a lens adjacent the polarizer and adjacent the analyzer, the polarizer and analyzer both adjacent the paramagnetic material (See Onaka et al. FIG. 18, lenses 87, polarizer 10, analyzer 30 and paramagnetic material 20). It would have been obvious at the time the invention was made to incorporate the lenses as taught by Onaka et al. into the noted combination. One having ordinary skill in the art would have been motivated to do so to focus the light beam into the paramagnetic material which allows for the apparatus to be made more compact in the direction of the width

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of the paramagnetic material (See Onaka et al. paragraphs 0144 and 0145).

Conclusion

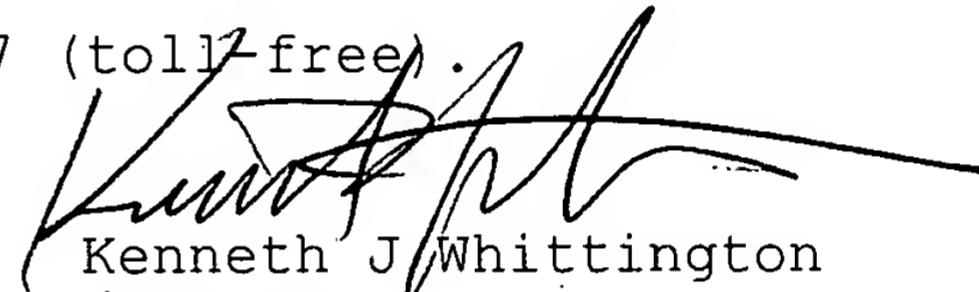
5 The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Those references cited disclose varying designs and atomic make-ups for Faraday rotators.

Any inquiry concerning this communication or earlier
10 communications from the examiner should be directed to Kenneth J. Whittington whose telephone number is (571) 272-2264. The examiner can normally be reached on Monday-Friday, 7:30am-4:00pm.

If attempts to reach the examiner by telephone are
15 unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).


Kenneth J. Whittington
Examiner
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kjw